

I claim:

1. A method of processing natural language, which comprises steps
providing electronically encoded data which is representative
of said natural language,

providing a dictionary data base wherein said dictionary data
base contains a plurality of entries which are comprised of one
or more of syntax usage data, associated word sense numbers
having associated state representation data, and/or function
codes,

lexically processing said electronically encoded data to
access said dictionary data base,

providing a grammar specification,

providing a data base of requirements such that said
requirements must be met by said associated state representation
data of said word sense numbers for said word sense numbers to be
selected,

utilizing said syntax usage data which are from entries of
said dictionary data base and which are associated with words of
said natural language with reference to said grammar
specification to select word sense numbers associated with said
natural language words such that said associated state
representation data of said associated word sense numbers meet
said requirements for selecting said associated word sense
numbers.

2. A method of processing as defined in claim 1, which comprises
steps

finding said natural language word which has no associated
word sense numbers which can be selected,

numbers of said selected natural language dictionary definition words,

associating said found dictionary data base entry with said dictionary data base entries of said natural language word which has no associated word sense numbers which can be selected.

3. A method of processing as defined in claim 1, which comprises steps

finding said natural language word which has no associated word sense numbers which can be selected,

providing electronically encoded data which is representative of a human readable natural language dictionary containing a plurality of natural language definitions of said natural language words,

lexically processing said electronically encoded data of said human readable natural language dictionary to access said natural language definitions,

lexically processing said electronically encoded data of said natural language definitions to access said dictionary data base,

utilizing said syntax usage data which are from entries of said dictionary data base and which are associated with words of said natural language dictionary definitions with reference to said grammar specification to select word sense numbers associated with said natural language dictionary definition words such that said associated state representation data of said associated word sense numbers of said natural language dictionary definition words meet said requirements for selecting said associated word sense numbers,

utilizing said selected word sense numbers and said associated state representation data of said natural language dictionary definition words to select said dictionary definition

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lexically processing said electronically encoded data of said human readable natural language thesaurus to access said natural language synonyms of said natural language word which has no associated word sense numbers which can be selected,

lexically processing said electronically encoded data of said natural language synonyms of said natural language word which has no associated word sense numbers which can be selected to access said dictionary data base,

utilizing said word sense numbers and said associated state representation data of said dictionary data base entries of said synonyms of said natural language word which has no associated word sense numbers which can be selected to select said dictionary data base entry such that said associated state representation data of said associated word sense number of said selected dictionary data base entry meets said requirements for selecting said word sense number of said natural language word which has no associated word sense numbers which can be selected,

associating said selected dictionary data base entry with said dictionary data base entries of said natural language word which has no associated word sense numbers which can be selected.

5. A method of processing as defined in claim 1, which comprises steps

finding said natural language word which has no associated word sense numbers which can be selected,

providing an experience and knowledge data base which is comprised of directed graphs comprised of nodes with associated access conditions for accessing said nodes and with associated clause implying word sense numbers organized into paths of said nodes such that said nodes have said access conditions which are met when said accessed node corresponds to a class of said

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natural language words which have no associated word sense numbers which can be selected and said accessed node contains clause implying word sense numbers which are utilized to ask questions about said class of said natural language words which have no associated word sense numbers which can be selected,

accessing said experience and knowledge data base nodes which correspond to said classes of said natural language words which have no associated word sense numbers which can be selected with said natural language word which has no associated word sense numbers which can be selected such that said access conditions of said node are met,

accessing said dictionary data base with said natural language words which are associated with said word sense numbers of said accessed node of said experience and knowledge data base,

utilizing said syntax usage data and said natural language words which are from said dictionary data base entries and which are associated with said word sense numbers associated with said accessed node with reference to said grammar specification to generate outgoing natural language to ask one or more questions about said natural language word which has no associated word sense numbers which can be selected.

6. A method of processing as defined in claim 1, which comprises steps

providing electronically encoded data which is representative of natural language words which state that said natural language word has a stated natural language definition,

lexically processing said electronically encoded data of said statement to access said dictionary data base,

utilizing said syntax usage data which are from entries of said dictionary data base and which are associated with words of

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said statement with reference to said grammar specification to select word sense numbers associated with said natural language statement words such that said associated state representation data of said associated word sense numbers of said natural language statement words meet said requirements for selecting said associated word sense numbers,

searching said dictionary data base without finding said dictionary data base entry containing said word sense number having said associated state representation data which includes said associated state representation data of said selected word sense numbers of said stated natural language definition words,

generating a new word sense number,

associating said associated state representation data of said selected word sense numbers of said stated natural language definition words with said new word sense number,

generating a new dictionary data base entry containing said stated natural language word having said stated definition and containing said new word sense number with said associated state representation data,

associating said new dictionary data base entry with said dictionary data base entries of said natural language word having said stated natural language definition.

8. A method of processing as defined in claim 1, which comprises steps

providing electronically encoded data which is representative of natural language words which state a requirement for word sense selection,

lexically processing said electronically encoded data of said statement to access said dictionary data base,

utilizing said syntax usage data which are from entries of said dictionary data base and which are associated with words of said stated natural language requirement with reference to said grammar specification to select word sense numbers associated with said stated natural language requirement words such that said associated state representation data of said associated word sense numbers of said stated natural language requirement words meet said requirements for selecting said associated word sense numbers,

searching said requirements data base without finding said associated state representation data of said word sense numbers of said stated natural language requirement,

associating said associated state representation data of said word sense numbers of said stated natural language requirement with said requirements data base.

9. A method of processing as defined in claim 1, which comprises steps

referencing said grammar specification to find said natural language words which are related by grammar usage,

finding said natural language word which is related by grammar usage and which has no associated word sense numbers which can be selected,

providing a state representation data specification which specifies said state representation data associated with natural language words which are related by grammar usage,

lexically processing said electronically encoded data of said found natural language word which has no associated word sense numbers which can be selected and which is related by grammar usage to access said dictionary data base,

utilizing said syntax usage data which are from entries of said dictionary data base and which are associated with said found natural language word which has no associated word sense numbers which can be selected and which is related by grammar usage with reference to said state representation data specification and with reference to said grammar specification to select said word sense number associated with said found natural language word such that said associated state representation data of said associated word sense number of said found natural language word and said specified state representation data of said natural language words which are related by grammar usage meet said requirements for selecting said associated word sense number,

associating said specified state representation data which is utilized to meet requirements for selecting said associated word sense number of said found natural language word with said selected word sense number of said found natural language word.

referencing said grammar specification to find said natural language words which are related by grammar usage,

providing an experience and knowledge data base which is comprised of directed graphs comprised of nodes with associated access conditions for accessing said nodes and with associated clause implying word sense numbers organized into paths of said nodes such that said nodes have said access conditions which are met when said accessed node corresponds to a class of said

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natural language words which have no associated word sense numbers which can be selected and which are related by grammar usage and said accessed node contains clause implying word sense numbers which are utilized to ask questions about said class of said natural language words which have no associated word sense numbers which can be selected and which are related by grammar usage,

accessing said experience and knowledge data base nodes which correspond to said classes of said natural language words which have no associated word sense numbers which can be selected and which are related by grammar usage with said found natural language word which has no associated word sense numbers which can be selected and which is related by grammar usage such that said access conditions of said node are met,

accessing said dictionary data base with said natural language words which are associated with said word sense numbers of said accessed node of said experience and knowledge data base,

utilizing said syntax usage data and said natural language words which are from said dictionary data base entries and which are associated with said word sense numbers associated with said accessed node with reference to said grammar specification to generate outgoing natural language to ask one or more questions about said found natural language word which has no associated word sense numbers which can be selected and which is related by grammar usage.

11. A method of processing as defined in claim 1, which comprises steps

providing electronically encoded data which is representative of natural language words which state that said natural language

words have said state representation data when said natural language words are related by grammar usage,

lexically processing said electronically encoded data of said statement to access said dictionary data base,

utilizing said syntax usage data which are from entries of said dictionary data base and which are associated with words of said statement with reference to said grammar specification to select word sense numbers associated with said natural language statement words such that said associated state representation data of said associated word sense numbers of said natural language statement words meet said requirements for selecting said associated word sense numbers,

associating said stated state representation data with said selected word sense numbers of said stated natural language words having said stated state representation data.

12. A method of processing as defined in claim 1, which comprises steps

providing electronically encoded data which is representative of natural language words which state that said natural language word has said state representation data,

lexically processing said electronically encoded data of said statement to access said dictionary data base,

utilizing said syntax usage data which are from entries of said dictionary data base and which are associated with words of said statement with reference to said grammar specification to select word sense numbers associated with said natural language statement words such that said associated state representation data of said associated word sense numbers of said natural language statement words meet said requirements for selecting said associated word sense numbers,

providing an experience and knowledge data base which is comprised of directed graphs comprised of nodes with associated access conditions for accessing said nodes and with associated clause implying word sense numbers organized into paths of said nodes such that said nodes have said access conditions which are met when said accessed node corresponds to a class of said natural language words which have no associated word sense numbers which can be selected and said accessed node contains clause implying word sense numbers which are utilized to ask questions about said class of said natural language words which have no associated word sense numbers which can be selected,

accessing said experience and knowledge data base nodes which correspond to said classes of said natural language words which have no associated word sense numbers which can be selected with said natural language word which has no associated word sense numbers which can be selected such that said access conditions of said node are met,

accessing said dictionary data base with said natural language words which are associated with said word sense numbers of said accessed node of said experience and knowledge data base,

utilizing said syntax usage data and said natural language words which are from said dictionary data base entries and which are associated with said word sense numbers associated with said accessed node with reference to said grammar specification to generate outgoing natural language to ask one or more questions about said natural language word which has no associated word sense numbers which can be selected.

14. A method of processing as defined in claim 13, which comprises steps

word sense number for said stated natural language word which has no associated word sense numbers which can be selected such that said access conditions of said node are met,

performing said processes of said accessed node to associate said stated data of word sense numbers with said dictionary data base and/or said requirements data base.

15. A method of processing as defined in claim 13, which comprises steps

providing electronically encoded data which is representative of natural language words which state data for selecting said word sense numbers for said natural language words,

lexically processing said electronically encoded data of said statement to access said dictionary data base,

utilizing said syntax usage data which are from entries of said dictionary data base and which are associated with words of said statement with reference to said grammar specification to select word sense numbers associated with said natural language statement words such that said associated state representation data of said associated word sense numbers of said natural language statement words meet said requirements for selecting said associated word sense numbers,

providing an experience and knowledge data base which is comprised of directed graphs comprised of nodes with associated access conditions for accessing said nodes and with associated processes organized into paths of said nodes such that said nodes have said access conditions which are met when said accessed node corresponds to a class of data of said word sense numbers for selecting said word sense numbers for said natural language words and said accessed node contains processes which associate said

class of said data of word sense numbers with said dictionary data base and/or said requirements data base,

accessing said experience and knowledge data base nodes which correspond to said classes of data of said word sense numbers for selecting said word sense numbers for said natural language words with said stated data of said word sense numbers for selecting said word sense numbers for said stated natural language words such that said access conditions of said node are met,

performing said processes of said accessed node to associate said stated data of said word sense numbers with said dictionary data base and/or said requirements data base.

16. A method of processing natural language, which comprises steps

providing electronically encoded data which is representative of said natural language,

providing a dictionary data base wherein said dictionary data base contains a plurality of entries which are comprised of one or more of syntax usage data, associated word sense numbers having associated state representation data, and/or function codes,

lexically processing said electronically encoded data to access said dictionary data base,

providing a grammar specification,

providing a data base of requirements such that said requirements must be met by said state representation data associated with said word sense numbers for said word sense numbers to be selected,

utilizing said syntax usage data which are from entries of said dictionary data base and which are associated with words of said natural language with reference to said grammar

specification to select word sense numbers associated with said natural language words such that said associated state representation data of said associated word sense numbers meet said requirements for selecting said associated word sense numbers,

finding said natural language word which has no associated word sense numbers which can be selected,

providing natural language sources such that each said source has electronically encoded data which is representative of words of said natural language which state data about said natural language words,

providing an experience and knowledge data base which is comprised of directed graphs comprised of nodes with associated access conditions for accessing said nodes and with associated data organized into paths of said nodes such that said nodes have said access conditions which are met when said accessed node corresponds to a class of said natural language words which have no associated word sense numbers which can be selected and said accessed node contains data which designates which of said provided sources has said natural language which state data about said classes of said natural language words which have no associated word sense numbers which can be selected,

accessing said experience and knowledge data base nodes which correspond to said classes of said natural language words which have no associated word sense numbers which can be selected with said natural language word which has no associated word sense numbers which can be selected such that said access conditions of said node are met,

processing to access said source associated with said accessed node to obtain said electronically encoded data which is

accessing said experience and knowledge data base nodes which correspond to said classes of data of said word sense numbers about said natural language words which have no associated word sense numbers which can be selected with said obtained stated data of word sense numbers about said natural language word which has no associated word sense numbers which can be selected such that said access conditions of said node are met,

performing said processes of said accessed node to associate said obtained stated data of said word sense numbers with said dictionary data base and/or said requirements data base.

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